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Lumbering and Forestry.

NO doubt it is true that, in the long run, the interests of the forester and of the lumberman are identical. The good people who look on lumbermen as public enemies because they cut down trees, should remember that the most conservative and scientific forestry has the same end in view; that is, the purpose of good forestry is not to save trees, but to cut them and use every one. The real case of the people against the lumberman is not that he cuts down trees to use them, but that he cuts extravagantly and destroys more than he uses. At the recent covention in Chicago, Mr. J. E. Defebaugh, editor of *The Timberman*, argued that, so long as the present conditions continue, the destruction of the forest is inevitable, and any policy of forest-preservation impossible. The argument is, that no nation can husband its chief resource. The United States exports wheat because it is possible to raise cheap wheat from virgin soils by robbing them of their fertility. Wheat would be no longer one of our principal resources, and we could not export a bushel, if the western growers were required to raise their wheat under an advanced system of husbandry which maintained the strength of the soil by using fertilizers. So with our forest-products. They are a leading resource because we can get them cheaply by wasteful methods. If we were compelled to practice the refinements of forestry, and keep in view the constant reproduction of the best timber, forest-products would no longer be cheap and articles of large export. In this view of the case, so long as timber-cutting and timber-selling are left to be controlled by ordinary financial considerations, we can expect no wise and far-sighted forest-policy until our forest-area is reduced and becomes small in proportion to our population. The only way to establish any system of forestry before the original forest is mainly cut away is to interest the entire people, so that, with due regard to individual rights, the forest-policy of the country should some how be under Government control.

There is a truth at the bottom of this somewhat discouraging view, but, even if it is accepted, we should remember that after all it is possible for lumbermen, with little expense, to adopt less wasteful methods, and it is possible, too, for the law to interfere and check some of our extravagant methods of cutting before the time is ripe for the state to take in charge the administration of our forest-property. Besides this, as Mr. Fernow pointed out at the same meeting, the time has already arrived, or, at least, it cannot be far distant, when timber-lands will be an inviting investment for those who wish to keep their forests for permanent cropping. He does not suggest the planting of forests from which the first returns are distant from thirty to a hundred years, although tree-planting by no means ought to be discouraged on the forestless prairies and in the plains country. Nor does he advocate the purchase of culled pieces of woodland from which the valuable timber has already been cut. But, inasmuch as it is possible, even now, to buy well-stocked virgin forest-lands which already contain a full-grown crop, half of which is valuable and accessible to large markets, for from $5.00 to $10.00 an acre, the more rational method would be to take this ready-made crop and apply to it systematic forestry. As the country has grown richer the rates of interest have declined, and if Government bonds, on account of their safety and the ease with which the interest is collected, bring less than four per cent., the compounding of interest on forest-property, which is safe and increasing in value, may justify us in making our estimates at a still lower figure. The investor in such timber-lands can at will draw interest, and he can anticipate it by taking advantage of favorable market conditions, and he can still have an investment capable of increasing its yield partly by the increased product under good management, and partly on account of increased price for this product. To enforce this view, Mr. Fernow states that during the last forty years the price of wood has increased in Germany at the rate of from one and a half to nearly three per cent. a year. In Prussia the price nearly doubled from the years 1830 to 1865, while between 1850 to 1891 it rose from three cents to nearly five cents a cubic foot for wood of all kinds and sizes. And since our virgin forest-supplies are being consumed at a rate which exceeds twice the capacity of the existing area to produce it, thrifty growing timber must surely increase in value. For long investments, therefore, timber-lands, under good forest-management, may even now be considered as equally profitable in the long run to timber-lands which are bought for the purpose of culling out all that is good and leaving the forest in a worse condition than it was before.

As for the waste of our ordinary lumbering methods, we have already said that, perhaps, when lumbermen learn more about the advantages of forestry, they will try to improve their practice. With regard, however, to the great sin against forestry—namely, forest-fires, which one would think affected the lumberman more directly than any one else—he seems to have a supreme indifference. Another speaker at this same meeting, Mr. Saley, editor of the *North-western Lumberman*, states that in the White Pine territory, where fires are most destructive, not only to timber, but to settlements and human life, he has only known one operator to burn his débris under supervision, and thus protect his own property and that of his neighbors. Very often the operator cares for no protection himself because he has cut every stick of timber on his own ground, and he has laid a train which must sooner or later be fired, to the danger of the timber which stands alongside of his boundaries and belongs to his neighbor. Then follows a passage, which we quote entire:

Here comes the legal aspect of the case, and it is surprising that the courts have not been asked to give their opinion regarding it. In common law, if a man desires to pile, without protection, combustible material on his lot adjoining the one on which his neighbor's house stands, he may do so, but he will be held accountable in case of damage for such losses as might naturally result from his negligence. If an operator permits the leavings of a logging job to collect and dry alongside the timber of another man, there is little question but in

law the operator would be held responsible if the timber was damaged as the result of a fire originating in these powdery brush-heaps. Yet, so universally is it held in logging circles that forest-fires are a natural consequence that never, to my knowledge, has a suit been brought for damage as a result of one. If there is the slightest suspicion that sparks from a locomotive or steam-tug set lumber in a yard on fire, litigation is sure to follow; but if a man permits his inflammable refuse to accumulate, and as a result there is a sweeping conflagration that does more damage than half the lumber-yards in the state are worth, not even blame attaches to him. The utter disregard of this phase of forestry—the prevention of forest-fires—is as deplorable as it is unaccountable. The plea of the operator is, that it would not be possible to so care for their débris that the great danger of forest-fires would be materially lessened. They really mean when they say this that the expense of such care would be greater than they would like to bear.

The sum of the matter is, as it was well presented by Mr. Saley, that the lumberman is not in business for the benefit of future generations. He is not even in business for a life-time. His thick saws are eating up lumber for the purpose of getting every dollar out of the woods that is possible, and as soon as possible, so that he can retire in a few years when the timber from his woodlands is exhausted. Perhaps law can reduce the waste by fire, but it is self-interest alone that must for the present be relied upon to induce him to manage his forest-property as if it had a value for his children. Scientific forestry will certainly come when the era of cheap lumber is over, and that day will arrive all too quickly. Allowing six thousand feet of timber to the acre, at the present rate of lumber manufacture an area as large as the state of Massachusetts is cleaned off every year, and this without including the wood that is used for fuel, for mining and for railway-tracks. With a population growing at the rate of a million a year, the demand for wood will be still more importunate, and the time when trees will be precious is hurrying on more swiftly than the nation realizes. Meanwhile it is the plain duty of every thoughtful man who has the highest interests of his country at heart, to set forth these facts as clearly and as frequently as possible, so that public sentiment, instructed to appreciate the close connection between the forests of the nation and its general health and prosperity, may insist upon the enactment of conservative forest-laws for the general good; so that the owners of forest-property may come to understand that the time is at hand when it will be a true economy for them, as well as for the best interests of the public, to conduct their business with an eye to the future value of their property; and so that capitalists and corporations will search for timberlands as a safe and permanent investment.

The Botanical Aspect of Pike's Peak.

PIKE'S PEAK, since the discovery of gold in the streams draining its base in 1858, has always been one of the best-known points of the Rocky Mountains, even to botanists, as the *Flora of Colorado* testifies. It is one of the peaks of the Colorado continental divide, with an altitude of 14,147 feet; north of it, at the same divide, are two higher summits, Long's Peak, 14,271 feet, a conspicuous landmark from the plains, and Gray's Peak, 14,341 feet, further west and invisible from the plains; south of Pike's Peak, in the Sangre de Cristo range, is Blanca Peak, 14,463 feet, the highest of the Rockies. It thus appears that these several peaks differ but little in altitude, and that being all within the state of Colorado the character of their vegetation must be much alike.

The railway carries the traveler from Denver to Manitou, at the very foot of Pike's Peak, in about three hours, by way of Colorado Springs. I left Denver on the morning of July 18th; the season had been unusually dry, even for this arid climate, and but few flowers were visible from the cars, besides road-side weeds like Cleome integrifolia and Argemone platyceras, upon which drought seems powerless; the former often grows in large clumps, forming pretty color masses, and might be utilized in places where water is scant.

Colorado Springs is a well laid out town on the plains, near the foot of the mountains, offering to invalids many attractions of climate and mountain scenery. Miles of its streets are lined with Cottonwood (Populus monolifera), planted close, as is too common in the west, and seldom showing its full, ample proportions; the absence of all other shade-trees, more ornamental and useful, evinces a sad want of public taste and judgment.

Manitou lies nestling in the bottom of a picturesque basin formed by towering mountains and dominated on the south by the round and bold summit of Pike's Peak. Mineral-waters spring from the ground in several places and enjoy a well-deserved reputation. Hardly any attempt has been made to introduce exotic trees, and the entire vegetation is practically of native growth. The Cottonwood and Willow-leaved Poplar (Populus angustifolia) are common, the latter, when allowed plenty of room, becoming a very neat shade-tree, much superior to the former. High on the slopes are light green patches of Aspen, seldom exceeding the size of a small tree. Near the streams are Box Elder, often of large size; Dwarf Maple (Acer glabrum), Black Birch (Betula occidentalis), and the western Choke-cherry (Prunus demissa), the latter with large, pretty foliage. Clematis ligusticifolia twines over walls and fences. Only one Oak (Quercus undulata, var. Gambelii) was observed, a very small, crooked tree, forming pretty clumps in the little town park, the dark, glossy green of the upper side of the leaves contrasting with the silvery white of the under side. This Oak extends a short distance up the slopes, meeting groves of the western Juniper (Juniperus occidentalis, var. monosperma). In the near cañons I noticed Rubus deliciosus R. strigosus, Jamesia Americana and Physocarpus opulifolia.

A cog-wheel railway runs up to the summit of the peak, and the ascent is accomplished in a comfortable car quickly and safely, indeed much too quickly for the botanical collector, the round trip from Manitou being made in four and a half hours. The altitude of Manitou is 6,629 feet, that of the summit 14,147, a difference of 7,518 feet, which is overcome by a little less than nine miles of railway, or at the rate of about 845 feet to the mile. The train stops but three times on its way up or down, and only the few moments necessary to take in water, while the stay on the summit is about forty minutes.

Of the Conifers seen at the base of the peak and during the ascent, the most conspicuous for its silvery-blue foliage and drooping purplish cones is the Blue Spruce (Picea pungens), which is common on the lower slopes; likewise frequent here, as everywhere else, are the Yellow Pine (Pinus ponderosa, var. scopulorum) and the Douglas Fir (Pseudotsuga taxifolia); the White Fir (Abies concolor) was also noticed. The order of distribution of these trees up the sides of the mountain might prove of interest, but I had no opportunity to ascertain it. The undergrowth comprises Aspen, several Willows, one Salix flavescens, reaching up the ravines of the high slopes, common Juniper, Juniperus communis, Cercocarpus parvifolius, Potentilla fruticosa and Spiræa discolor.

Many flowers grew alongside the track, in the damp, grassy clearings, as well as on the jagged boulders, and during the slow ascent could be recognized from the car-windows. The most common and conspicuous were Epilolium angustifolium, Geranium Fremonti? Pentstemon glaber, Mertensia Sibirica, Aquilegia cœrulea, Aconitum Columbianum, Geum rivale, Campanula rotundifolia, Zygadenus elegans, Castilleia miniata. Bouquets collected in the near vicinity, and offered for sale by boys at the stopping-places, contained specimens of Calochortus Gunnisoni, Lilium Philadelphicum and Dodecatheon Meadia; others, higher up, were made entirely of the very pretty but too heavily scented Mertensia alpina. Common was Cnicus eriocephalus, a large, woolly Thistle, strikingly decorative.

The timber extends to the altitude of about 11,500 feet; beyond this upper "timber-line" one sees nothing but bare slopes reaching up to the rocky top. The vegetation of these upper slopes is one of the most interesting botanical features of the ascent. The plants are small and stunted, hardly anywhere thick enough to form a sod; the only woody one noticed was Potentilla fruticosa, very much dwarfed. Only one low, cespitose Grass was collected, Poa Lettermani, of which Mr. L. H. Dewey, who kindly determined it, writes that "it is a rare specimen, and has been found only on the high peaks of the Rocky Mountains." The other plants collected in this locality (at the stopping-place) are Mertensia alpina, also reported from other very high altitudes; Allium Nuttallii, with deep rose flowers; a small yellow Castilleia (breviflora?), Silene acaulis, Saxifraga flagellaris, Geum Rossii and its variety humile, Sedum Rhodiola, forming purple spots on the tawny surface, also reported from other high peaks; Polygonum Bistorta, and a species of Arenaria.

Other plants described in the *Flora of Colorado* as having been collected on Pike's Peak, altitude not mentioned, are Saxifraga punctata, S. Jamesii, Primula angustifolia, Androsace Chamœjasme, Chionophila Jamesii. It is presumed that they belong to the upper slopes near or above the timber-line.

The slopes become more broken and rocky as the train rises; the temperature falls, and an overcoat is necessary long before reaching the top; this is a comparatively level surface, a few acres in extent, covered with broken boulders and of most unattractive aspect. Here stands the signal-station which for many years has crowned the peak; it is a low, substantial stone building, able to withstand the wind velocity of 120 miles an hour, which is not unfrequently recorded; it is connected by telegraph with the world below. As the traveler steps out of the car his attention is first called to himself before he proceeds to gaze on the wonderful panoramic view spread before him; this rise of a mile and a half in the upper air within two hours seriously disturbs the physiological functions; there has not been sufficient time for a readjustment to the lowered pressure; one has a faint, dizzy sensation; the heart beats quickly, the breathing is somewhat labored, and the hearing is impaired; it is necessary to move about slowly, at least during the first few moments; invalids liable to hemorrhage had better not make the ascent.

It is an unpleasant surprise to find the summit of Pike's Peak so perfectly dry and barren; not a patch of snow could be seen at this season. The same remark applies, in a variable measure, to the other summits of the Rocky Mountains; although now and then temporarily whitened in summer, none are covered with perpetual snow, owing to the very scant precipitation. Not a trace of vegetation is visible at the first glance; nothing but sharp-angled stones, between which it is not practicable to find a pathway. After diligent search I was able to find three very modest plants, all in blossom, none of them credited to this peak in the *Flora of Colorado*. The finest is a Polemonium, with rather large and pretty blue flowers; Dr. Morong, to whom I referred it, thinks it a form of P. humile. All visitors endeavor to procure specimens of it as souvenirs, but few succeed. It has also been reported from Chicago Lakes, altitude 12,000 feet, while another species, P. confertum, has been collected on Gray's Peak at the same high altitude. My second plant is Claytonia megarrhiza, a dwarf, acaulescent form, with the white flowers mostly under, and not much exceeding, the rosette of fleshy leaves. This has also been reported from Gray's Peak at an altitude of 14,000 feet. The third plant is Saxifraga chrysantha in its typical form.

Other plants credited in the *Flora of Colorado* to the "summit of Pike's Peak" (the "summit" probably including some of the adjoining slopes) are Arenaria verna, var. hirta (probably my doubtful species before mentioned), Cymopterus alpinus, Erigeron compositus, Artemisia scopulorum, Senecio amplectans, var. taraxacoides, Castilleia pallida, Gentiana frigida, Carex otrata, var. ovata. Some of these have doubtless disappeared from the summit, the prey of the hundreds of visitors eager to secure any kind of vegetable growth as remembrances of their trips.

Under the circumstances, considering the stony sterility of the soil, the constant low temperature, the terrific winter hurricanes and the long summer drought, it is, perhaps, a matter of wonder that so many species, so widely separated in their affinities, have found a foothold on or near this summit.

Fort Russell, Wyo. *V. Havard, U. S. A.*

A Naturally Grown Chrysanthemum, Florence Percy.

THE illustration of one of our Chrysanthemums on page 456 is an example of what we here like to call an unmutilated specimen. At Kew we rather pride ourselves in setting a good example to growers of these plants, but I am bound to admit that exhibitors do not yet follow our lead, preferring to grow tall, one-legged plants for the sake of big blooms, or globe-shaped bushes with a single bloom only on every branch. This method has only one result, the desired one, of course, which is big, well-formed full blooms, but the plants, like all painfully trained specimens, are deprived of nearly all true, natural beauty. There are not many plants, either indoors or out, that naturally form handsomer bushes than the Chrysanthemum; this, I think, must be admitted by every one with taste, on looking at this picture of the lovely white-flowered variety, known as Florence Percy. Of course, a considerable amount of the gardener's art must be expended on plants grown even in this style, but the art is cunningly hidden, the stopping, pinching, staking and disbudding being all performed with a view to enhancing the natural beauty of the plant, and not for the purpose of making it something quite unlike a Chrysanthemum.

At Kew we grow about three hundred plants yearly for the decoration of the conservatory and large winter-garden. The varieties preferred are those which form shapely bushes and are not too high; at the same time as great a range of variation in color, form and size of bloom as possible is aimed at.

There is much that is charming and interesting to botanists, as well as to the every-day visitor, in the truly wonderful development of the Chrysanthemum at the hands of the cultivator and breeder. By the way, can any one help Kew to a living plant of the typical Chrysanthemum, C. porifolium? It must be plentiful in China, and probably also in Japan. It would be a most interesting plant to grow by the side of the Edwin Molyneauxs, Avalanches and Florence Percys of the present time.

Kew. *W. Watson.*

October in a West Virginia Garden.

FEW flowers are now to be seen in the borders, and fewer still in the shrubberies, but many Roses have renewed their youth since the heat and drought of summer have given place to frosty nights and abundant moisture. Hermosa is a valuable Rose at this season. Safrano, Isabella Sprunt, Adam and several varieties of the Polyantha class, are blooming with some profusion, and small plants of Laurette, set in the spring, are showing one or two flowers each. In spite of some sharp frosts, Ulrich Brunner is bearing a few rich dark velvet, very double blossoms that have all the fragrance of June.

In the shrubbery, Vitex Agnus-castus is now blooming for the first time. This plant has lived out without protection for several seasons. It was cut down to the ground by the severe weather last winter, but has made good growth in spite of the drought, and is four feet in height and adorned with a few spikes of small purple flowers. The five lanceolate leaflets are whitened underneath and are now a dull greenish-maroon on the upper surface. These leaflets are pleasantly aromatic, and the appearance of the shrub is very attractive, especially when contrasted with the deep green of some Halesias in the same group. Its near neighbor, a fine Callicarpa Americana, is covered with its small lustrous berries of reddish-violet. The Witch-hazel is decked with yellow fringe,

and its exploding seed-vessels have fired their last salute to the departing season.

The trees that are the first to change color, such as the Sour Gums and Sugar Maples, have already lost their brilliancy. Many of them lost the greater part of their foliage on the thirteenth of this month, when a violent gale uprooted a superb Oak on the premises, which measured eleven feet in circumference four feet from the base, and was apparently quite sound and healthy.

The Sweet-brier, with its abundant scarlet hips and sparse foliage, still green and fragrant, is one of the most beautiful objects in the fading shrubbery. Not less brilliant are the berries of Thumberg's Barberry, which are unusually numerous. The branches, covered with pink and dull red leaflets, and weighed down with fruit, fairly glow in the bright sunshine. Other handsome berries, now at their best, are those of Cotoneaster Simonsii, which are cherry-red, contrasting prettily with the foliage, which is still a dark green. Spiræas are putting on their brilliant autumn colors, but the so-called golden-leaved variety of Spiræa opulifolia has now lost all tinge of yellow and is an uniform dull green.

The beautiful Hypericum Mosserianum has been blooming a second time for a fortnight past, and is still full of buds, which scarcely find warmth enough to encourage them to open. The flowers, which have been already described in Garden and Forest, are very large, bright and showy, and are fairly numerous. It is a plant for the herbaceous border rather than the shrubbery proper, and contrasts well with Aster oblongifolius, which is making its little corner gay with numerous bright blue blossoms. Near by the Japanese Anemone is in bloom, and a few trumpet-shaped blossoms of the pretty evergreen, Abelia rupestris, fill the air with delicate perfume. This little shrub is hardy as far north as Philadelphia, and, perhaps, it would endure a still higher latitude with a little winter protection. It is quite largely planted in the public grounds at Washington, and visitors always admire it.

Rose Brake, W. Va. *Danske Dandridge.*

Foreign Correspondence.

London Letter.

At the last meeting of the Royal Horticultural Society, Orchids and other indoor plants were numerous, the best collection coming from L'Horticulture Internationale. It contained exceptionally good varieties of Cattleya labiata (Warocqueana), of C. elegans, one of these called Lucianii having the deepest and most brilliantly colored labellum I have ever seen in this species; and of C. Acklandiæ; a superb variety of C. maxima, named Leopoldii, and remarkable for the rich maroon with golden reticulation of its labellum; a long four-flowered spike of the tawny-colored C. Alexandræ; a stout four-flowered scape of the beautiful and majestic Cypripedium Rothschildianum and a new hybrid, called Spicero-Lowianum, combining the characters of the two parents, the first-named predominating in color and form. Cattleya Eldorado, var. Owenii, which received an award of merit, is an albino with a rich amethyst blotch and a yellow throat. Cochlioda vulcaniucum, var. grandiflorum, was shown with a twelve-flowered scape, the flowers nearly twice as large as in the type.

Messrs. J. Veitch & Sons sent an improved form of Cypripedium Arethurianum, called superbum; this owed its superiority in the depth of color and tinge of rose in the dorsal sepal, to the fact that it was bred from the Chantini variety of C. insigne Cattleya chloris; a hybrid between C. Bowringiana and C. maxima was awarded a first-class certificate, and was considered to be one of the handsomest of the newer hybrids, the flowers being five inches across, of the color of C. Bowringiana, with the labellum of C. maxima. A second hybrid Cattleya, named Pheidinæ, and raised from C. maxima and C. intermedia, with a good deal of the characteristics of the former parent, obtained an award of merit. From Messrs. F. Sander & Co. came a group of Orchids, conspicuous among them being some very fine varieties of Cattleya labiata, the rare Pescatorea Klabochorum, Cattleya Kranzlini, a hybrid between C. elegans prasiata and C. Wagneri, an attractive plant with sepals and petals, as in C. elegans, rosy-mauve, the lip wavy and crisp with a yellow throat and maroon blotch; Batemannia Burtii, and a group of Phalænopsis Lowii. Messrs. B. S. Williams & Son exhibited the rare Pachystoma Thomsonianum, Dendrobium Phalænopsis and other species from tropical Australia. Messrs. Hugh Low & Co. showed Vanda Kimballiana, which we owe to them, and which is one of the very best of the Vandas when properly grown, producing spikes nearly two feet long; Stanhopea Amesiana, a pretty white-flowered species of recent introduction; Dendrobium Lowii, a rather rare plant now, one of the nigro-hirsute section and reputedly difficult to grow; and Masdevallia muscosa, the sensitive-lipped species. Major-General Beakeley exhibited a part white-lipped variety of Odontoglossum Uro-Skinneri, and Kew sent a new hybrid Disa, named Premier, raised from D. Veitchii and D. tripetaloides, a sturdy plant with a spike eighteen inches high, bearing six large, bright rose-crimson flowers. It was awarded a first-class certificate.

Among the general plants the Kew exhibits ranked first in interest, four of them receiving first-class certificates. They were

Solanum Wendlandii, of which three enormous bunches of bloom were shown, and which is admitted to be one of the very finest stove-climbers in cultivation. At Kew there is now a plant of it trained against a rafter in a warm house, and bearing a great number of large heads of rich blue flowers. It is emphatically a plant for every stove.

Bomarea patacoensis (conferta), with stems twenty feet long, each terminated by a drooping cluster of rich red flowers quite as large as those of Philesia, and, as there are thirty or more flowers on a bunch, its beautiful effect can be imagined. A strong well-established plant continues to produce flowers all the year round.

Tecoma Smithii.—A hybrid raised in Australia a few years ago from T. Capensis and T. velutina, the latter a variety of T. stans. It is a first-rate greenhouse-plant, and would be a glorious climber for verandas in countries where it could be grown out-of-doors. At Kew it is grown on the dwarfing system, which results in plants scarcely two feet high, bearing large terminal heads of the most delightfully attractive yellow flowers. It is a plant for the million.

Ptychoraphis augusta.—I told your readers of the merits of this Palm some months ago. It has all the grace and elegance of Cocos Weddelliana, with the free growth and good constitution of a common Kentia. It was introduced to Kew from the Nicobar Islands last year. Other exhibits from Kew were Clematis Stanleyi, which is a really pleasing plant when planted in a sunny border in rich soil and treated like Anemone Japonica, its elegant silvery foliage, numerous rose-purple nodding flowers and ornamental fruits being effective toward the end of summer. Kniphofia modesta is a tall species introduced to Kew from Kafraria a few years ago, and now established in a border. It is remarkable in being white-flowered, the scapes being three feet high and the leaves narrow and grass-like. A series of seedlings of Streptocarpus was also shown. Messrs. Veitch also showed Streptocarpus and a basket of plants in flower of the dwarf blue-flowered Caryopteris mastacanthus, which only just falls short of meriting a place among first-class hardy shrubs; it is not quite hardy enough for English gardens, and the blue of its flowers is rather dull in shade. Anthurium Wambeckianum, a white-spathed hybrid in the way of A. ebarneum and Hæmanthus Lindeni, a pale form of the variable H. multiflorus, both shown by *L'Horticulture Internationale*, were awarded first-class certificates. Two first-rate winter-flowering Carnations, shown by Mr. J. Godfrey, Exmouth Nurseries, were awarded certificates; they were named Reginald Godfrey, a soft pink full flower, with crisped petals, good in form, and very fragrant, and Mary Godfrey, similar in shape to the other, but pure white; the plants were dwarf, with good grass. Nerine elegans, var. alba, shown by Mr. T. Ware, Tottenham Nurseries, is a white variety of the hybrid raised some years ago from N. flexuosa and N. rosea; the flowers of the albino are

large, good in form and substance, and snow-white. It obtained a first-class certificate.

A fine variety of Red Oak, Q. coccinea, shown by Mr. Anthony Waterer under the name of splendens, was awarded a first-class certificate. It is the same as the plant shown last year as Knap Hill Oak. Mr. Waterer also showed flowers of his Spiræa callosa, var. A. Waterer, and a bunch of branches of Spiræa Thunbergii, the leaves colored rich orange and scarlet, a beautiful plant in autumn.

LILIUM NEPALENSE.—A group of this beautiful Indian Lily was shown by Messrs. H. Low & Co., with whom it is proving to be a first-rate garden-plant. It bids fair to become a popular Lily with growers of these plants. It would be interesting to know how these newer Indian Liliums would behave under cultivation along with L. longiflorum in the Florida fields.

PENTSTEMON ANTIRRHINOIDES.—This interesting shrubby species of Pentstemon was introduced to Kew from California about twenty years ago, and flowered in the open ground in September. It is not, however, hardy, and consequently it had disappeared from cultivation here until last Tuesday, when it was shown in flower at the Royal Horticultural Society meeting by Sir Trevor Lawrence. It may be well known in American gardens, but in case it is not I may say it is a much-branched, glabrous, subcinerous shrub with slender leafy shoots, suggesting those of Myrtle or Leptospermum, and bearing numerous lemon-yellow flowers an inch across, short in the tube, with the lower divisions of the limb incurved. It might prove a good plant to cross with the popular herbaceous species of the genus.

London. *W. Watson.*

New or Little-known Plants.

Orchid Notes.

CYPRIPEDIUM CHARLESWORTHII.—This new species has recently been introduced from the East Indies by Messrs. Charlesworth, Shuttleworth & Co., of Bradford, by whom a plant in flower was exhibited at the last meeting of the Royal Horticultural Society, and obtained a first-class certificate. It has strap-shaped green leaves, veined on the under side, and distinct beautiful flowers borne singly on scapes three inches long. The upper or dorsal sepal is nearly three inches in diameter, and is white, with rose-purple veining; the two lower sepals are greenish white. The petals are nearly two inches long, straight, smooth-edged, and colored brownish yellow. The lip resembles that of C. insigne, and is of a yellowish color, with brown shading. The staminode is conspicuous, being large, flat and pure white. Mr. Rolfe is responsible for the name of this plant.

DISA VEITCHII × TRIPETALOIDES.—This is a new hybrid raised at Kew, where it is now flowering for the first time. As will be seen from its parentage, it combines three distinct species. D. Veitchii being the result of crossing D. grandiflora with D. racemosa. As I surmised some time ago when writing about D. Veitchii, these hybrids are much easier to cultivate than most Orchids, and they increase as rapidly as Couch-grass. The new hybrid has a crowded rosette of sturdy green leaves, from the centre of which springs a scape as thick as a swan's-quill and one and a half feet high. The flowers are as numerous as on D. racemosa, nearly two inches across, and colored deep rose. I can recommend these tufted Disas to any one in search of promising material to breed from, as it is scarcely possible to make a mistake in crossing and raising them from seed.

CATTLEYA BLESENSIS is a new hybrid between C. Loddigesii and Lælia pumila Dayana. It was shown in flower last week by Messrs. B. S. Williams & Son, and obtained an award of merit. It is a healthy-looking, free-growing plant in the way of C. Loddigesii, and produces three or four flowers on a scape, each larger than either of the parents, the sepals and petals being colored rosy mauve, and the front lobe of the wavy edged labellum maroon-purple.

SATYRIUM MEMBRANACEUM, S. PRINCEPS and S. ERIOCARPUM are handsome species of this large genus of south African terrestrial Orchids, which have been well flowered in several London collections this year. Satyriums are structurally interesting as well as being generally pretty in flower, and if they were only a little less refractory under ordinary treatment they would soon become general favorites.

Kew. *R.*

Cultural Department.

Early Deciduous Shrubs.

THE length of time during which the leaves of trees and shrubs persist on the plants in the autumn is a consideration which naturally comes within the province of the landscape-gardener. This is especially true where it is designed to plant for effect during a particular month or time in the autumn. Although there are few plants which, as species, can be stated to lose their leaves regularly within a limited specified time, the general tendency is often clearly shown, and can be relied upon. Different species of the same genus frequently show great differences in persistence of foliage. Something also depends upon condition and environment, and the same species may show considerable differences between youth and old age, and rich and moist or poor and dry soils. Young vigorous plants in good ground, as a rule, will hold their leaves longer than more mature plants in soil containing less available plant-food. Grafting, too, on particular kinds of stock, must have an effect in hastening or retarding defoliation. The effect of climate, and the consequent acquired habits of the species in its native home, are also inherited traits which are carried with it and long perpetuated in its new surroundings. Therefore we have plants that originally grew in a more moist climate and with more extended autumn, which, transplanted here, hold their leaves for a longer time than our closely related native species.

After only one or two light frosts within the preceding week, and after a very dry autumn and some late wind-storms, a large number of shrubs are found to be practically leafless by the 20th of October, and a look over the collection furnishes some instructive points in comparison.

Among twiners, Schizandra Chinensis has lost all foliage, and the native Bittersweet, Celastrus scandens, has lost a large proportion of it, while the Asiatic C. articulata is still fresh and full. The Virginia Creeper, Ampelopsis quinquefolia, lost all, or nearly all, its leaves some time ago, after changing to brilliant crimson and red colors, but the Japanese A. tricuspidata (A. Veitchii of gardens) still holds its foliage intact, and displays the bright hues earlier shown by its American congener. Leaves of native species of Vitis show the effect of frost, but more have fallen from V. Labrusca than from others, although the Asiatic V. Amurensis showed its tendency to earlier maturity by shedding its leaves before any indication of frosty weather, and the plants are now quite bare.

Leaves of Moonseed, Menispermum, have largely turned brown or fallen, but some still maintain a fresh and green appearance; and, although Actinidias have as yet dropped no leaves and are mainly fresh and green, they have turned brown and dry where touched by frost.

Calycanthus shrubs are half bare, the leaves turning to a yellow-brown before falling; and few plants of our native Prickly Ash or Toothache-tree, Zanthoxylum Americanum, show any foliage remaining on their prickly stems. The American species of Evonymus are practically without leaves; two or three introduced hardy Asiatic species have lost a large proportion of them after changing to rich autumn colors, but the common European species, Evonymus Europæus, and its various garden forms still retain an almost midsummer green and fullness. Our little native Rhamnus alnifolius lost its leaves some time ago, and the European common Buckthorn, Rhamnus catharticus, has, in many situations, lost a large proportion of them. Among the Winterberries, Ilex lævigata and I. monticola are now half bare of foliage, which, before falling, turns to a pretty light yellow color; but I. verticillata is still quite green. The Bladdernuts, or species of Staphylea, are also now half leafless, or in some cases quite so.

The only Sumach which holds its leaves up to this time is the European Smoke-tree, R. Cotinus, which is still fresh-looking and has not lost a leaf. The leaves of all the native

species, after changing to their usual brilliant autumn colors, have now nearly all fallen and left the stems bare, or with only the main leaf-stalks persisting. Our Poison Sumach, Rhus Vernix, is the first of all to drop its foliage; the Poison Ivy, R. Toxicodendron, holding them for a somewhat longer time.

Of plants of the Pea family, the Amorphas have lost all foliage, and most of the Siberian Caraganas are bare or nearly so, although some forms of C. arborescens still hold a good many leaves in a green condition. The true Lespedeza bicolor lost its leaves and dropped its fruit several weeks ago.

Few of the shrubs or small trees of the Plum family bear good foliage up to this time, and the hardiest are the first to shed their leaves. The early fall of the leaves of these, as well as of many other plants, is often caused by fungous diseases. This is particularly true of the Amelanchiers or Juneberries, which by this time are generally entirely bare. Except some sub-evergreen kinds, most of the Cotoneasters are also in poor condition as regards foliage, but the fruit still persists.

Fig. 67.—Chrysanthemum, Florence Percy—naturally grown.—See page 453.

Among Spiræas, S. sorbifolia was long ago quite leafless, S. media followed, and on this October 20th, S. cana, S. prunifolia, S. hypericifolia and S. chamædryfolia offer little or nothing attractive, so far as foliage is concerned. The Asiatic Physocarpus Amurensis is nearly leafless, while our native Nine-bark, Physocarpus opulifolius, is still green. Few kinds

of hardy wild Roses have late persisting foliage, but our native Rosa lucida and R. nitida hold most of their leaves with varying shades of autumn color and of the foreign species, R. rugosa, R. spinosissima and R. Wichuraiana have scarcely dropped any as yet and have a full and comparatively fresh appearance. The pale yellow leaves of the Witch-hazel have mostly fallen, only to show the remnants of its flowers more clearly; and the true Hazels, or native species of Corylus, are quite destitute of their summer dress, and the only noticeable features displayed are the male catkins, ready to open next April.

Arnold Arboretum. *J. G. Jack.*

Garden Notes.

THE lesson we should learn in the garden at this season is the value of warm spots and sheltered places for late-flowering plants. In this latitude we seldom have more than two or three killing frosts before the end of October. These are likely to occur any time after late September. Very often we lose all our tender plants early in October, after which we have a long succession of bright days and cool nights, when the plants would be quite safe, and, of course, doubly enjoyable. Until November we seldom have weather severe enough to kill any but the most tender plants when they are on the south side of a dwelling or other structure. The obvious suggestion from this is that we should early in the season make our plantings so that we may enjoy our favorite flowers as long as possible. In such locations Nasturtiums are still proudly in flower, and we ought to have some early Chrysanthemums, Cosmos, Japanese Anemones and other late-blooming plants. Should extremely cold weather threaten, these positions offer an excellent opportunity for temporary overhead protection, which cannot be given elsewhere without considerable difficulty.

Some good flowers are still holding their place in the open, and none more steadily than the night-blooming Tobacco (Nicotiana affinis), which shows a surprising persistency of bloom under adverse circumstances. Except for the ragged appearance of its flower-buds in the middle of the day, this plant is one of the best of hardy annuals. It will rapidly propagate and maintain itself in the border, and the flowers are decidedly attractive, with somewhat powerful though pleasant fragrance.

Iris alata, the Scorpion Iris, is one of the most charming flowers of the season, usually commencing to bloom about the middle of October. This Iris may be flowered in the border in this latitude, but requires a warm position, and should be sheltered by bell-glasses or other protection, to preserve the purity of the flowers. It belongs to the section of bulbous Irises which have thick, long, permanent roots, and are rather awkward subjects for pot-culture unless extra deep pots can be secured. I have had the best success with them by planting out in a cool house, where they make better growth than in pots, with longer and stronger leaves and a longer flower-tube. The leaves are Leek-like, and appear just before the flowers. These vary somewhat in coloring, being mostly more or less deep shades of lilac-blue, though there is a white variety. All the flowers, however they may vary in size or color, are exquisitely delicate. The falls are generally fringed, with yellow ridges. The fact that this Iris makes its growth at this season makes it a difficult one to ripen up and retain in good condition, and it requires special care and a warm sunny position after flowering. The flowers, it may be added, last in good condition for a number of days, and are very fragrant with an odor which may be likened to a mixture of violet and rose. If it is difficult to describe a color, it is doubly difficult to convey an idea of a perfume. In no direction are our senses generally less acute and cultivated than in the detection and discrimination of odors. Few persons could close their eyes and name correctly a dozen of the commonest flowers presented to them for name. With unfamiliar flowers the average observer usually refers the odor to one of half a dozen flowers. It is curious, in this connection, that the perfumer also, for his synthetical odors, depends for his bases on some half dozen odors—rose, cassia, orange, violet, jasmine and tuberose—with which, in combination with various oils, resins and animal secretions, he undertakes to reproduce any scent of the floral kingdom. Knowledge of odors, based on perfumers' productions, is very misleading, as the deftest artist is hampered in his work by an inherent defect of his materials. These each have a different evaporating point, and to a sensitive nostril each odor produces in succession a series of separate and distinct impressions. Perfumes of the highest character are retained for some months to blend, but they always retain this radical defect, and their analysis is usually possible by a keen observer. The ordinary perfumer is apt to trust as much to his labels as to the contents of his bottles for his distinct odors, and the sale of rivers of essence of violet which do not even resemble violets, and crab-apple-blossoms which are lilies-of-the-valley, prove how little the public knows of odors.

Elizabeth, N. J. *J. N. Gerard.*

Autumn Work.

A REALLY sharp frost has brought about a decided change in the aspect of the garden, and it is now possible to put things in order for the winter. It is generally acknowledged that to dig over a border of herbaceous plants, with a view to benefit them, is an operation requiring decided skill, an accurate knowledge of the location of each plant or bulb and the manner in which the roots are disposed. This knowledge is not given to all, even if the time to act upon it were at our disposal, hence the fork or spade is never used in our border, except when planting is to be done. Once the border is planted for a permanent effect, if this be done with forethought, there remains very little to do beyond thinning out and transplanting occasionally. But borders need replenishing every year with food for their occupants for the next season, and this can be supplied at this season better than at any other. The growth of most plants is now matured, and can be cut down and all the débris removed, including weeds (and some very good garden-plants attain to this distinction if given an opportunity), and when all is cleared off a good coating of well-pulverized manure or leaf-mold may be placed over the whole border. There need be no fear of smothering the plants; the rains and the worms will carry most of it down to the roots, and the digging-in process may easily be dispensed with, and the plants will thus be saved from the dangers which a spade, especially in unskilled hands, always threatens.

The unusually dry fall weather has retarded all planting operations, and the bulk of this must, with us, remain to be done in spring, hence other work, and, in fact, all possible work, should now be pushed to help out in the spring rush. Where it is intended to plant, the ground can be prepared and dug deep. I always like to double-dig—that is, twice the depth of the spade—by keeping a wide open trench where it is intended to plant for a permanent effect, adding the manure as the work proceeds. This breaks up the subsoil. If this is poor, however, keep it at the bottom, but enrich it, and the roots of trees, shrubs and plants will go down and feast there and be out of the reach of temporary drought.

Vacancies will occur even in well-managed gardens, and, whether of trees or low-growing plants, it is equally true that there are each season gaps that require to be filled—and in these emergencies the nursery-garden, advocated before, is a very helpful adjunct. I have found that evergreen-trees, when brought from a distance, do not always take kindly to new surroundings, especially if set out where it is presumed they will remain, and it is often best to set them where they can be carefully tended for the first year and allowed to make a second year's growth in the same position, and then a careful removal to permanent positions can easily be made with greater satisfaction to those concerned, who have had an opportunity to study their habits and requirements as to soil and exposure. After a tree is finally planted on the lawn its greatest enemy is the mowing-machine, and it is surprising what an amount of persuasion it takes to stop the machine just in time to miss the young growth at the tips of the lower branches, especially of fine young Conifers. We have been obliged to cut away a circle of sod underneath the branches, and around each tree, and put on a neat mulching; this also is of great benefit to the tree, it keeps the surface soil open and accessible to every drop of rain that falls, and while, as in the past season, the surrounding grass has been parched for want of rain, on removing a little of the mulch the soil under the trees always showed a damp surface, and not a tree suffered, except where the roots of Elms intruded.

South Lancaster, Mass. *E. O. Orpet.*

Correspondence.

The Best Lilacs.

To the Editor of GARDEN AND FOREST:

Sir,—I shall be much obliged if you will print in your columns a list of the best hardy Lilacs.

Providence, R. I. *A. M. Eaton.*

[Of the varieties of the common Lilac, Syringa vulgaris, the best white-flowered variety is Marie Lagrange, and the best dark-flowered is Philamon, both of which have

been described in the columns of this journal (see vol. i., p. 196). Charles X. is one of the best dark Lilacs, and among newer kinds Louis Späth is exceedingly promising. Nurserymen offer a large number of named varieties of Lilac, but the best colors can be obtained with the four mentioned. The Lilac season, however, can be greatly prolonged by the cultivation of several of the other species of the genus. The earliest of all to flower is the north China Syringa oblata. The flowers of this valuable plant, which are lilac color, are smaller than those of the best forms of S. vulgaris; they are extremely fragrant, however. The leaves, which are thick and leathery, turn late in the autumn to the most brilliant shades of crimson. S. pubescens (see Garden and Forest, vol. i., pp. 222 and 414, and vol. vi., p. 266) should be in every collection in the northern states, where it thrives admirably. The flowers are creamy white and pink, with long tubes, and are borne in small compact clusters, which are produced, however, in the greatest profusion, and the flowers are delightfully fragrant. S. villosa is a stronger-growing and a more vigorous plant, also from northern China. The flowers are creamy white to light pink, and are borne in large clusters, appearing after the flowers of the other Lilacs have disappeared; they emit a disagreeable odor. S. Chinensis, which is intermediate in character between the ordinary Lilac and the Persian Lilac, is one of the best of these plants; it flowers rather later than the common Lilac, and produces immense clusters of purplish red and fragrant flowers. It is a strong-growing erect shrub, and should find a place in every garden. For a full account of the species of Lilac, and illustrations of the least-known among them, see Garden and Forest, vol. i., pp. 220, 521.—Ed.]

The Pinetum at West Chester, Pennsylvania.

To the Editor of Garden and Forest:

Sir,—Twenty years ago Mr. Josiah Hoopes, known to the student of trees as the author of an excellent work on Conifers, planted in connection with his nursery in West Chester, in this state, a pinetum, with the view of testing the hardiness and adaptability of his favorite plants to the climate of the middle states. The collection, which was made as complete as possible, was planted on the top of a hill somewhat protected by neighboring plantations, and in good, strong, well-drained soil. No special care has been given to the plants, and those which remain are standing in a thick sod of grass. It is safe to assume, therefore, that the species which are still represented in the collection are suited to our climate; and as a report on their condition and appearance may, perhaps, interest the public, I shall endeavor to give a brief account of the collection for the benefit of your readers.

Before describing the trees that are left standing, it will be well to explain that all the species and varieties of Cupressus have disappeared entirely, as have most of the south European, Indian, Mexican and South American species and their varieties. With a few exceptions, all the Conifers of the Pacific states of North America have succumbed to our cold winters or moist summers. Few of the Pines which were planted twenty years ago are left. The European Pinus sylvestris, P. Austriaca and P. Laricio are alive, but have passed the period of their greatest beauty and show signs of premature decay. Pinus Strobus nivea has grown into a compact and handsome plant, but the other forms of the White Pine have disappeared, owing, perhaps, to the attacks of a new enemy, which, Mr. Hoopes informs me, has destroyed many of the White Pines in West Chester. P. monticola, its western representative, has grown into a tall thin specimen some twenty feet high, showing the thin lanky habit of this tree in cultivation, which is, however, one of the hardiest of the western Pines here at the east, although as an ornamental tree it cannot be compared with the native White Pine. Of the other White Pines, the Sugar Pine, P. Lambertiana of California, and P. excelsa of the Himalayas have disappeared, but the collection still boasts, in perfect health and beauty, one of the best specimens of P. Peuce of south-eastern Europe which can be found in cultivation—a narrow compact pyramid fifteen feet high and clothed with foliage to the ground. P. densiflora, easily distinguished by the white terminal buds, is eighteen feet high, wide-branched and covered with cones. As an ornamental tree it is no better than the Austrian Pine and is inferior to our native Red Pine (P. resinosa) or our northern Pitch Pine (P. rigidia), which we looked for in vain. They appear to have succumbed, as have the following American species: P. palustris, P Sabiniana, P. flexilis, P. pungens, P. inops and P. tæda, while P. Koraiensis, of Corea, and P. Bungeana, of northern China, have grown into remarkable specimens. The former, which is related to the Swiss Stone Pine, is represented by two or three beautiful specimens twenty-five or thirty feet high, branched to the ground, and of a deep and most perfect color. This species appears to succeed wherever it has been planted in the eastern states; it is one of the handsomest and most distinct of Pine-trees, while for small lawns and gardens it has the advantage of growing to a height of only thirty or forty feet and of holding on to its lower branches. Unlike our White Pine, this species does not shed its leaves until the end of the third or fourth year, so that it is denser and more leafy in appearance. So far as I have observed, Mr. Hoopes' specimen of P. Bungeana has not its equal in cultivation. From the base of the stem several branches turn up and form a dense broad pyramid of great interest and beauty. It is usually as a curiosity only that this Pine, which is absolutely hardy in eastern America, finds a place in collections, where its stout, rigid pale green leaves and scaly bark always attract attention; but if it is fair to judge of its merits by the West Chester plant, it should certainly be planted as an ornamental tree.

Several Firs have grown into handsome trees, although it should be remembered that a Fir twenty years old is at its best as an ornamental tree, and that with greater age it too often grows thin in the lower branches and loses much of the perfection of form which makes some young Firs beautiful objects. To the lover of rare trees the most interesting Fir in the collection is a plant of Abies amabilis, of the Cascade Mountains of Oregon and Washington. This plant has evidently had a hard time in getting a start in life, but now looks strong and vigorous and is about six feet high. Although discovered by David Douglas more than sixty years ago, this tree has remained one of the rarest of all the American Conifers in cultivation, and it is only within the last few years that eastern nurserymen have been able to obtain a supply of seeds. Mr. Hoopes' plant, small as it is, is perhaps the largest specimen in the eastern states. Abies amabilis, as it grows on the Cascade Mountains, is one of the handsomest of its race, with crowded leaves, dark green and lustrous on the upper surface and silvery white on the lower, and large dark purple cones. The arrangement of the leaves, crowded close together on the upper side of the branches, resembles that of the leaves of A Nordmanniana, which is in every respect a less beautiful tree. Two or three handsome specimens of the White Fir of the Sierras, the Abies concolor of botanists, and in gardens variously called A. Lowiana, A. lasiocarpa and A. Parsonsiana, bear witness to the beauty and hardiness of this noble tree, which is the only Pacific-coast Fir which is really satisfactory in the eastern states. A. Nordmanniana, which has grown taller than any other Fir in the collection, appears to be suffering from an overproduction of cones, and, moreover, is getting thin near the ground, showing, what I have observed before, that in our climate it is only in early age that this tree is really beautiful. A. Pinsapo, the Spanish Fir, which is not usually considered very hardy or desirable here, is in perfect condition and great beauty, and so are good specimens of A. Cephalonica, A. Cilicica, one of the best of all Firs in our climate, and A. Apollinis. A remarkably slender and compact pyramidal form of the Fir of Europe, A. pectinata, is one of the most noteworthy plants in the collection. A. Sibirica already shows the loose habit and feeble lower branches which appear to disfigure this tree in cultivation by the time it has grown to be twenty feet high.

Among the Spruces, Picea orientalis takes the lead in beauty and vigor. This tree, so far as is possible to judge at this time, is one of the handsomest and most satisfactory of all the exotic Conifers which have been brought into our gardens; it is surprising that it has not become more common in this country. The Colorado Spruces, P. pungens and P. Engelmanni, are in good condition; indeed, the hardiness and vigor of these two trees seem able to resist any sort of climate or soil that can be found in the northern or middle states, although P. pungens, or, as it is usually called, the Blue Spruce, has a way of losing its lower branches, which indicates that its greatest beauty will disappear before it reaches half its natural size. The Tide-water Spruce of the north-west coast, P. Sitchensis, is ragged and unsatisfactory, and appears to suffer from the cold of the Pennsylvania winters and the long, hot, dry summers. On the other hand, P. Smithiana, of the Himalayas, is in excellent condition, and promises to grow into a large and beautiful tree.

A remarkably fine plant of what is known as Whales' Norway Spruce, a pendulous-branched sport of the Norway Spruce which originated many years ago near Boston, will interest persons who care for trees of monstrous form.

There are no remarkable specimens of Juniperus in the collection, and the Cedars have all gone, although in a neighboring garden there is a good plant of the Lebanon variety. There is a healthy little specimen of the western Mountain Hemlock, Tsuga Pattoniana, a plant too rarely seen in our collections; but the Hemlock of the north-west coast, T. Mertensiana, has disappeared. There is a fair, but not a remarkable, specimen of the Japanese Sciadopitys, and large plants of the Japanese Retinosporas (Chamæcyparis obtusa and C. pisifera), but none of the juvenile or monstrous forms of these two trees have attained any size or beauty. Of the two types, Mr. Hoopes considers the latter the more rapid-growing and valuable tree. As an ornamental tree, however, it is certainly less beautiful than C. obtusa.

The Torreyas, although representatives of the three species were planted here, have disappeared, as have the Sequoias, the Libocedrus and the Cryptomeria. The European Yew, in many forms, holds its own, and so do its North American and Japanese congeners. The last is a tree to be recommended to American planters; it is the hardiest of all the Yews, and one of the most distinct and valuable of Conifers for the northern states, where no other arborescent Yews will flourish. A very distinct golden variety of Taxus Canadensis in the collection I had not seen before.

Enough, perhaps, has been said to show the value of this pinetum as an object-lesson to planters of coniferous trees, who will find it one of the best places in America to study these plants and to learn what to plant and what not to plant, which is even more important; and all American students and lovers of trees certainly owe Mr. Hoopes a debt of gratitude for the means of acquiring much useful knowledge which he has placed within their reach.

This letter has already reached such a length that I can only mention the fact that in the grounds surrounding the house first built by Mr. Hoopes in West Chester is a good collection of trees planted by him in 1854. Among them are the finest specimen of Abies nobilis I have seen in the eastern states, a perfectly healthy plant thirty or thirty-five feet tall; large plants of Picea orientalis, and remarkable specimens of the Chinese Magnolia and of Magnolia Fraseri of our southern Alleghany forests.

Philadelphia, Pa. *S.*

Sulphuric Acid and Water.

To the Editor of GARDEN AND FOREST:

Sir,—I observe that the writer of Lawn Notes, in a recent number of your journal, gives the advice, when making a dilution of sulphuric acid, to place the acid in the jar, and then add the water. I have been taught differently. If water is poured on sulphuric acid the first portion of it which strikes the acid will boil and sputter, and some of the burning acid will be thrown out of the jar. In diluting the acid pharmacists are accustomed to add the acid very gradually to the water, with constant stirring. Great heat is evolved during the operation, and if the admixture is not made slowly the breaking of a glass vessel might readily result.

Somerville, Mass. *L. C. Flannagan.*

The Columbian Exposition.

Gardening about State and Government Buildings.

THERE are four pieces of ornamental gardening at the Fair which are distinctly unlike any other, and much superior to them. They are all connected with individual buildings—one with the State Building of Pennsylvania, another with that of New York, a third with that of Massachusetts, and a fourth with the Convent of La Rabida. These four garden pieces are so unlike each other in effect that they cannot be compared. They are all singularly well adapted to the general effect of the buildings which they support. The Pennsylvania Building is characterized by a freedom and hospitality of style which seems to demand a warmth of cheer and welcome in the planting. This color is well supplied by a bank of glowing Madame Crozy Cannas which stand against the high front of the sweeping porches. This planting has probably been the best individual mass of color in the Fair. The most important and novel lawn-piece about this building is a large bed of mixed Crotons, from Mr. George Huster, of Girard College. Mr. Huster seems to have the credit of introducing these plants into color-beds, and if the plants are short and stocky, not exceeding one to three feet in height, and the colors are well selected, they are capable of very satisfactory use. A few good individual specimens of Palms and Hibiscus complete the essential features of this decoration, all of which is in charge of Mr. Robert Craig.

What the Pennsylvania Building gains by the profuse use of color, the New York Building, which is its neighbor, secures by stove-plants. The architecture is formal and pretentious, and any mere color-masses or lawn-beds would appear trivial in the comparison. The foliage-effects are produced by temporary plants massed into the angles about the steps and wings, where they produce the same effects which the banks of Palms or Bamboos or Pampas-plumes give to the supporting angles of the terraces about the great buildings, especially in the vicinity of the Court of Honor. The plants which are used with good effect against the New York Building include Ficus variegata, Araucarias, Crotons, Dracænas, Box, Salix rosmarinifolia, and various stove-plants. The entrance itself is re-enforced by excellent large tub specimens of Sweet Bay and various Palms; and upon either side the antique fountains and mosaic are dressed with Papyrus, Aspidistras, Eichornia and Monstera. About the corridors and porches are many good specimens of Palms, comprising Areca Verschaffeltii, Seaforthia elegans, Phœnix rupicola and P. reclinata and Kentia Belmoreana. The roof parapets are adorned with Sweet Bays in antique vases. Siebrecht & Wadley have charge of the embellishment of this building.

Next to the New York Building is the charming, home-like building of Massachusetts, in the true colonial style, re-enforced with its terrace and esplanade. Here, again, is a distinct type of ornamentation. The terrace-wall at the confines of the lot rises three or four feet high, and this is surmounted by a fence about four feet tall, and the whole is covered with a most profuse drapery of the interesting Japanese Hop, sprinkled with the Scarlet-runner Bean and the Morning Glory. The esplanade inside this wall is some fifty feet wide, of which about ten feet upon the outer side is covered with a free border of shrubbery. In this shrubbery are Dogwoods and Spiræas in profusion, Lycium Chinense, Solanum jasminoides, Lilacs, Kerrias, Symphoricarpuses, Lonicera Morrowii, with now and then a sprig of Wormwood or Daphne Cneorum. Against the building is a mixed border of remarkable interest and beauty, which contains many of the familiar flowers, with masses of Sunflowers against the windows. Among the plants which give this border a home-like and native charm are Marigolds and Asters, Balsams, Funkias, Calendulas and Alyssum, Wild Asters like Aster Novæ-Angliæ and A. Tradescanti, Helenium autumnale and Hollyhocks. Excellent plants of the western Helianthus orgyalis grow against the front porch, and give it much spirit. Upon the west side of the building a terrace about ten feet wide has been brilliant with Pæonies, Campanula Carpatica, "The Pearl" Achillea, Pyrethrum uliginosum, Golden Fleece Chrysanthemum, Bouncing Bet, Ragged Robin, Eupatorium ageratoides, Zinnias, Coreopsis lanceolata, Eulalias, and the like. The planting was designed by Woodward Manning, and its immediate care is in the hands of Louis Guerineau, a gardener of long experience.

The ornamentation about the convent—which is made by the landscape department of the Fair—is designed to represent the sodless vegetation of a hot and arid region. It abounds in succulents like Sedums, Portulaccas, Mesenbryanthemums, House-leeks and various stiff desert-like plants. Among the more familiar plants one notices an abundance of Salvia splendens, Bocconia cordata, Single Dahlias, Cinerarias, Petunias, Ageratum, Œnotheras, Artemisia and various big Solanums. The variety of vegetation, the superabundance of odd forms, and the masses of burning color, all enforce the sunny feeling of the place. The pretty court inside the building has a centre of Phœnixes, with Bananas in the corners, and intermediate plantings of dark-leaved Cannas, Cobœas and Caladiums, and window pots and boxes of red Geraniums, English Ivy and Lantanas.

Other buildings have conspicuous ornamental features. The great California Building is surrounded by a variety of interesting sub-tropical plants, but they are scattered about the lawn with the evident purpose of showing them off, rather than to make any garden-design to support the building. This nursery includes many good specimens of Washingtonia filifera, Phœnix Canariensis, Chamærops excelsa and C. Nepaulensis and various interesting plants like Romneya Coulteri, Wiegandia, Leucodendron argenteum, Loquat, Erythea edulis and Tree Roses. The great Date Palm, grown from seed planted about 1770 by Father Junipera Serra, in the Mission Valley of San Diego, stands inside the building, rising to a

height of fifty feet, and a specimen with larger trunk and nearly as tall, from Santa Barbara, stands in the lawn.

The Louisiana Building, which represents a plantation-house, has various good plants in the yard, but they exist as individual specimens only. Here are Roses, Bambusa falcata, Caladiums, Loquats, Palms, Camphor-tree, Pittosporum Tobira and a bush of Evonymus Japonica six feet high. The gray moss, or Tillandsia, hanging from the Catalpa-trees in front of the house, give a southern feeling to the place. The Missouri Building was conspicuous during the whole summer and fall for its excellent bank of Solanum Warsewiczioides which masked the foundations. The French Building, upon the lake front, has had some striking effects, especially in gaudy edgings of Cineraria, Alternanthera and Lobelia. Various variegated or otherwise interesting specimen shrubs have been conspicuous, particularly Ilexes and Evonymuses. Rhododendrons and Altheas are also used, and there are a lot of good Phœnixes from Martichon, of Cannes. But the ornamentation about the French Pavilion, as about the California Building, has a much too scattered character to answer the purposes of landscape effect.

Chicago, Ill. *L. H. Bailey.*

Notes.

The Chrysanthemum exhibition of Pitcher & Manda at Short Hills, New Jersey, is thronged with visitors as we go to press, and will continue the week through. A neat little pamphlet on the history, classification and cultivation of the Chrysanthemum is given to each one, and the blank pages for memoranda opposite the names or numbers of new varieties are very convenient for those who wish to make notes of special characters. A more complete account of this exhibition will be given in the issue of next week.

A correspondent of the *Gardeners' Magazine* urges the use of bones as drainage for Chrysanthemums in the place of potsherds. His experience is that fresh bones, which, when buried, begin to decay and smell offensive, seem to injure the plants, the tips of them stopping short and appearing as if burnt. But when old and dried bones are used, the roots soon adhere to them and the plants show the advantage of this treatment by remarkable vigor. It is suggested that when fresh bones are to be used they should be buried two months at least before use, so that they can go through the first stage of decomposition. If they are then taken care of they will answer much better purpose the following year.

A shingle-roof which had been put on fifty-three years ago was lately removed from a house in Nashville, Tennessee. Four kinds of shingles were used indiscriminately—poplar, oak, chestnut and walnut. The poplar shingles led in soundness, followed in order by the chestnut, walnut and oak. The chestnut had simply worn away, the walnut had a dry rot on the under side of the exposed portion, and the oak had rotted. The shingles were rived and hand-drawn. It is not probable that a modern sawed shingle of either wood would have lasted half as long. Besides cutting across the open ducts of the wood, and affording inlets for moisture, the saw leaves a fuzz on the surface of the shingle which causes it to dry off more slowly after a rain.

To Dr. N. M. Glatfelter we are indebted for a copy of his paper on the venation of Willow-leaves, printed in advance from the fifth annual report of the Missouri Botanic Garden. This is an attempt to group twenty-three species of North American Willow according to the venation of their leaves, and to find characters by which they can be recognized by this means. Whether in practice such a scheme will be found of value, only use can tell. It will have, of course, the disadvantage that different species have sometimes a very similar arrangement of leaf-veins, and that, as Dr. Glatfelter points out, there is often considerable variation in this respect in the same species at different seasons of the year. The paper is accompanied by a glossary of terms which might in some cases be advantageously substituted for the rather loose expressions usually used in describing the leaves of plants.

Persons interested in the discussions which have appeared in recent years in botanical journals between the advocates of the mechanical and physiological theories on the origin and purpose of Cypress-knees, will find an interesting paper on this subject in the fourth part of the fifth volume of *Studies from the Biological Laboratory of the Johns Hopkins University*, from the pen of Dr. John P. Lotsy, in which the development of the knees is explained and well illustrated, without, however, any theory of their use being established or proposed. The discovery of a fungus in the knees, with no trace of mycelium except near the top, suggests the idea that it is this fungus which may be the cause of the formation of the knees, although, of course, this can only be demonstrated by cultural experiments. Unfortunately, Dr. Lotsy's material was preserved in strong alcohol, so his attempts to germinate the spores of the fungus were rendered impossible. This paper is preliminary to an exhaustive study of the subject.

In a paper on Strawberries, read before the Columbus Horticultural Society, Professor Lazenby gave the following summary of the essential points to be kept in mind by cultivators: (1) The most profitable varieties for the commercial grower are those not easily influenced by differences of soil and climate. Those which succeed well on wide areas are usually better than those which have a more local reputation. (2) Pistillate varieties, when properly fertilized, are more productive than the sorts with perfect flowers. (3) The value of a variety for fertilizing pistillate flowers does not depend so much upon the amount as upon the potency of its pollen. (4) The flowers of pistillate varieties are less liable to be injured by the frost than the flowers of perfect varieties. (5) Varieties that are neither very early nor very late in point of maturity are the most productive and have the longest fruiting season. (6) As a rule, varieties that have the most vigorous and healthy foliage are the least productive, while those with a weaker growth of foliage and a greater susceptibility to leaf-blight are usually the more prolific. (7) Winter protection may be dispensed with upon well-drained sandy soils, but appears to be a necessity upon heavier ones. (8) The leaf-blight may be checked by using the Bordeaux mixture, beginning just as soon as the leaves appear and continuing the application every few weeks throughout the season.

A correspondent of the *Journal of Horticulture* considers that wild-flower competitions are among the most satisfactory of flower shows. In many places in England there are often fifty entries for a bouquet of wild flowers by children, who are in this way taught to arrange their flowers tastefully. In such a competition the work of arrangement should be done by the children themselves, and they should receive no help from others. To secure this result a rule is inserted in some schedules stating that the children's bouquets are to be arranged at the place of exhibition, where each child is allowed a space on the table with ample room to work, under the supervision of a committee. Perhaps this is not the best method of securing a good display, but in one village eighty little workers were seen engaged on the morning of a show with a committee-man in charge sitting at the end of the table. Some of the bunches came out in very uncouth forms, but many more indicated clearly that the exhibitors had been practicing for some time, and this would prove that the object of educating the children in this direction had been partially attained. In this country we have noticed very few prizes given for the arrangement of wild flowers, but wherever there has been a prize for collections with the correct names of the plants which were staged, the result has always been interesting. Exhibitions of wild flowers can hardly help exciting a useful educational influence.

Salway peaches, comparing favorably in quality and size with any California peaches seen here this season, were a part of the forty-four car-loads of California fruit sold in this city last week; the best of these bring seventy-five cents a dozen at retail, the other kinds from that state now seen here being Bilyeu, October Blush and October Late. A few peaches from Connecticut and northern New York may still be had, but the long market season of peaches, which began with the arrival of the first Peentos from Florida in the middle of May, is about ended. Grapes make the staple fruit shipments from California, while from eastern vineyards above two hundred car-loads are reaching this city each week. Choice Black Muscat grapes, from Rhode Island hot-houses, bring a dollar a pound, and selected bunches of Gros Colman, from Long Island, a dollar and a half. Coe's Late Red plum is the only California plum now offering, and sells at eighty cents for a five-pound box. Lawrence pears, from New York state, of extra size, bring sixty cents a dozen. Jamaica oranges, which are riper and sweeter than the Florida fruit at this time, find ready sale at fifty cents a dozen for the largest, Satsuma oranges from Florida being sixty cents a dozen. California quinces of enormous size are a feature of side-walk fruit-stands, where they are offered at from fifteen to twenty-five cents apiece. Pomegranates from Spain are a dollar a dozen, and the first Italian chestnuts bring twenty cents a pound. Cranberries are accumulating on the hands of the wholesale dealers; the fruit is almost without demand, and the large stock will make slow sales until the advent of cold weather.